



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

A Proposed Code of Ethics for All Engineers

By A. G. CHRISTIE

Professor of Mechanical Engineering, Johns Hopkins University, and Chairman of the Joint Committee on Ethics of American Engineering Societies

ENGINEERING is slowly establishing itself as a profession. Some people question whether it is a true profession or a business. Let us note how a profession is defined and then we can determine at once whether the term "profession" applies to engineering.

A professional man must have obtained some preliminary attainments in special knowledge and some measure of learning, as distinguished from the mere skill that comes from experience as an administrator or as a mechanic. He must also apply such knowledge in practical dealings with the affairs of others, rather than in mere study or investigation for his own purposes. A professional career implies a sense of public responsibility for the accomplishment of certain social objectives. In other words, the professional man must be ready to render public service where his special training and experience makes him particularly fitted to do the work. Finally, he must adhere to the code of ethics of his particular profession, which should be so well known by the public that they understand what to expect of that particular class of professional men.

The engineer is being called upon more and more to render public service. He possesses special knowledge of his particular branch, which he applies practically in advising others or in serving their interests or welfare in the practice of the art of engineering. It is quite logical, therefore, to conclude that engineering can be ranked among the professions, together with law and medicine. It is secondary that, up to the present time, engineering has not had a common code of ethics well

known to the public at large, although individual societies have had their own codes.

NO ESTABLISHED CODE OF ETHICS AMONG ENGINEERS

The profession of medicine has had an ethical code since the days of Hippocrates and possibly even earlier. As law courts developed, custom and usage established certain requirements of an ethical character to be fulfilled by those who practised in the courts as lawyers and by those who administered the law as judges. The ethical standards of these two professions have been slowly developed throughout the centuries, until now both have well defined and very complete codes, covering all the usual contingencies that may occur in professional practice. These respective codes serve to maintain the dignity of profession and its high regard by the general public because they are accepted by most doctors and lawyers, and are carefully administered.

Engineering, on the other hand, is a relatively young profession. True, there were military and civil engineers in the old days and many of the instruments still in use were first developed by the ancients. However, the great inventions about the middle of the eighteenth century and the industrial development that followed during the early part of the nineteenth century, turned men's minds from philosophy towards the study of science and its applications to the uses and conveniences of man. New branches of engineering developed as the art broadened, until there were at least three well-recognized branches of the profession, viz., civil, mining and mechanical

engineering. Afterwards electrical, chemical, metallurgical, sanitary, automotive and many other branches of engineering came into existence.

In the early days there were no technical schools or universities to train men for engineering. The young engineer secured his training by years of apprenticeship under one of the older men or else he applied himself mentally and physically to some particular problem until he became a master of it, and thus became leader in his particular line of endeavor. This was the case of the late John Fritz, one of America's pioneers in steel production. Later on, colleges of engineering were founded. While many leading engineers of the present day have not had the benefit of a college education, they have, by their own personal efforts and achievements, well earned for themselves the right to be considered members of the engineering profession. The diversity of the engineering profession and the various methods by which one may train himself to be an engineer, are the main factors that differentiate engineering from the professions of law and medicine and make it extremely difficult to formulate any legal regulations concerning who may call themselves engineers.

In law and medicine all who enter the profession must pursue certain definite courses of study and must demonstrate by examinations before recognized boards that they have achieved a degree of proficiency in certain fundamental studies before they are admitted to practise their vocation.

In engineering, on the other hand, there have been many engineers of the highest rank, like George Westinghouse, Thomas Edison and John Fritz, who would have been debarred from the profession if they had had to pass examinations for admission. It is this wide diversity in the character of training for the engineering profession that

makes it practically impossible to require engineers to be licensed by examination. It is also a serious obstacle in the way of the formulation of a common code of ethics. Engineers have not been trained to take any specific viewpoint regarding professional conduct, and practice in the various branches therefore differs in certain details. In the future it should be the function of engineering colleges to develop among students a greater sense of professional unity than at present, and a better understanding of what constitutes proper professional conduct as expressed in the common code of ethics. Such action will greatly enhance the honor and dignity of the engineering profession.

ORGANIZATION AMONG ENGINEERS

The lack of an engineering literature in the early days led engineers to come together in societies for the interchange of technical information. The first of these was the Institution of Civil Engineers in England, established on January 2, 1818. The objects of this historic institute were stated as follows: "For the general advancement of mechanical science and more particularly for promoting the acquisition of that species of knowledge which constitutes the profession of a civil engineer, being the art of directing the great sources of power in nature for the use and convenience of man."

The first American organization was the Boston Society of Civil Engineers, organized July 3, 1848. The American Society of Civil Engineers was organized in 1852, followed by the American Institute of Mining Engineers (now the American Institute of Mining and Metallurgical Engineers), started in 1871. The American Society of Mechanical Engineers was founded in 1880. The American Institute of Electrical Engineers was organized in

1884. The American Society of Heating and Ventilating Engineers was established in 1894.

Probably the first engineering organization to develop a code of ethics was the Institute of Civil Engineers in England. Their code, consisting of only six clauses, set the standards of the profession in England for many years, and is still followed.

During the early years of each of the American organizations, its membership was generally limited to the leaders of that respective branch of engineering. These men devoted themselves largely to interchange of technical information in order to broaden their experience in their particular line. Later on, practical engineering standards received attention. These two factors, the exchange of technical information and the establishment of engineering standards, are still the most important functions of our leading engineering societies.

Within the last two decades engineers have turned their attention to administrative as well as to purely technical work and have applied the engineering methods of analysis to business and even to the problems of government. Engineers, in many capacities, rendered professional services of the highest order during the late World War. In fact, it has been called an "engineers' war." In Canada, Mr. Thomas Deacon, an engineer, was Mayor of Winnipeg during the years of its most rapid development, and conceived and put through many of the most important of the city's undertakings. Mr. Herbert Hoover, an engineer, as Director of the Belgian Relief during the European War, and later as Secretary of Commerce in the United States, has rendered public service of a high order.

The general public has been slow to recognize engineering as a profession and has failed until recently to dis-

tinguish between the trained engineer and the mechanic or contractor. This is largely due to the fact that engineers have had no established common rules of professional ethics that they recognize among themselves or that are generally understood. The public knows that doctors and lawyers are bound to abide by certain recognized rules of conduct. Not finding the same character of obligations imposed upon engineers, people have failed to recognize them as members of a profession.

EARLY ATTEMPTS AT THE FORMULATION OF A CODE

About fifteen years ago this situation received the attention of leaders in various American engineering societies, and committees were appointed to draw up codes of ethics for several of these organizations. These committees did excellent pioneer work and wrote some splendid codes which, when analyzed, show that the same high motives prevailed in the various branches of engineering, although expressed differently in the several versions. The early codes can be found in the publications of the various organizations. Naturally there were some points on which the different codes were not in agreement. A difficulty arose when the question of administering these codes came up for consideration, due to the fact that what was forbidden in one code might be tolerated in another. The engineer who belonged to more than one society was frequently in a dilemma from these conflicting rules. The codes in each case simply reflected the practice of the profession at that time. Engineers had not then reached the point where they acted as a unit. Committees on professional conduct were appointed in various societies, but due to insufficient authority and to other causes, they have never functioned in the way that

they were intended. This was partly due to the attitude of engineers themselves. They have been reluctant to act as policemen and to inaugurate a case against a fellow engineer, even though he may have been guilty of professional misconduct. The medical societies, on the other hand, spend large sums each year in keeping fakers and dishonest practitioners out of the profession,

Furthermore, the constitution of certain of the engineering societies lacked any provision for disciplining its members when found guilty of such misconduct. Hence these administrative committees usually ceased to function, and the codes of ethics of such societies have generally been forgotten. The membership of all organizations has increased rapidly in recent years and many of the present members do not know that their particular organization ever had a code of ethics. In fact, even the president of one of the national societies recently ruled from the chair that the society had no code of ethics, as he was not a member when one had been adopted several years earlier and it had never been called to his attention since he became a member.

The late Isham Randolph, of Chicago, wrote an excellent code entitled "The Engineer's Applied Ethics" for the American Association of Engineers, and, to their credit, it should be said that they have made a sincere effort to administer this code effectively.

The late war brought about a spiritual awakening throughout America, and this led many engineers to give serious consideration to the status of their profession. During the fall of 1919, Dean M. E. Cooley, then President of the American Society of Mechanical Engineers, appointed a committee, of which the writer was chairman, to report on the code of ethics of

that society and its administration. Only one member of the committee, Mr. Charles T. Main, had previously taken much interest in professional ethics. Some time had therefore to be devoted to a study of ethics and of the society's code which had been adopted in 1913. In the spring of 1920 the committee reported to the society that the former code seemed too long and had been generally forgotten by the members. A preliminary draft of a shorter code was offered for discussion. This was referred back to the committee, who gave the matter further consideration. A second report was presented at the annual meeting of the society in December, 1920, where a provisional draft of a code of ethics and suggestions for its administration were debated at length. The committee appreciated the desirability of a common code of ethics for all engineers in every branch of the profession and suggested that action be taken to prepare such a common code. The society again referred the report back to the committee with the recommendation that an effort be made to prepare such a common code of ethics for the whole engineering profession.

ORGANIZATION OF THE JOINT COMMITTEE

In the meantime the Federated American Engineering Societies had been organized and the engineering profession had gained a new feeling of unity of purpose. At first it was thought that the preparation of a common code of ethics should be undertaken by the new federation. However, this organization had already undertaken the investigation of waste in industry and other urgent matters were demanding its attention. It was therefore thought best to leave the matter of a common code of ethics with the member societies. It was further considered advisable to

have a relatively small informal committee to prepare a code, rather than a large unwieldy formal committee. Invitations were therefore sent to several representative societies to delegate certain of their members to serve on this informal committee. This action was taken by most of the societies. The American Institute of Electrical Engineers, however, left the question in the hands of their Committee on Professional Conduct, who afterwards took part in the informal deliberations on the code.

The Joint Committee faced a tremendous problem. Doctors and lawyers serve a limited clientele in what might be described as a consulting capacity, corresponding in a way to the consulting engineer. A vast majority of engineers are employed by corporations, commissions, governmental bodies and private individuals in administrative, managerial, sales, manufacturing and technical work. A lesser number are consulting engineers. It is a difficult task to define the obligation of engineer to client or employer and the attitude of the engineer to fellow engineers, to the public, and to technical and other educational institutions. Since the committees appointed to administer the former codes had dealt with practically no cases, there were no so-called "court decisions" to assist the Committee in defining good professional conduct. Furthermore, there were differences in practice on certain details among the various professions which had to be harmonized. The Joint Committee, at its first meeting, therefore, decided that a short simple code of ethics, expressed in general terms, was the only one possible under the present circumstances and further, that the code should, if possible, be no longer than could be written on a single sheet of typewriter paper, so that it might be more easily kept

before the members of the profession. Such a code would be less likely to be laid aside and forgotten than a lengthy explanatory dissertation.

It is human nature to dislike rules that prohibit certain acts, such as "Thou shalt not do so-and-so." It was therefore the opinion of the Committee that the new code would make a stronger appeal and would have greater dignity if expressed in positive rather than negative language, and this idea was paramount in the formulation of the code. Committees on professional conduct were recommended in each society to interpret and administer the new code and a committee to act as a supreme court was suggested to harmonize interpretations among the different societies. If this procedure is adopted it will be possible in later years to have another committee add either additional clauses or explanations to the code based on the decisions and interpretations of these committees and on the development of professional thought among engineers themselves.

Men do not always understand the same meaning to be conveyed by a certain word. Hence even after the fundamental ideas of good professional conduct had been agreed upon, and a rough draft of the code was prepared, much time was spent in clothing these ideas in simple English words that would be acceptable to the whole Committee. Valuable assistance in this work was rendered by friends in the legal profession and by certain professors of English. The task, however, was finally accomplished and the final report of the Joint Committee reads as follows:

REPORT OF THE JOINT COMMITTEE ON A CODE OF ETHICS FOR ENGINEERS

The Joint Committee consisting of representatives of the American Society of Civil Engineers, the American Institute of Min-

ing and Metallurgical Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Society of Heating and Ventilating Engineers, appointed to consider a Code of Ethics for Engineers, recommends, after deliberate consideration, that each participating Institute or Society adopt the short simple Code of Ethics which follows:

A CODE OF ETHICS FOR ENGINEERS

Engineering work has become an increasingly important factor in the progress of civilization and in the welfare of the community. The Engineering Profession is held responsible for the planning, construction and operation of such work and is entitled to the position and authority which will enable it to discharge this responsibility and to render effective service to humanity.

That the dignity of their chosen profession may be maintained, it is the duty of all Engineers to conduct themselves according to the principles of the following Code of Ethics:

1. The Engineer will carry on his professional work in a spirit of fairness to employes and contractors, fidelity to clients and employers, loyalty to his country and devotion to high ideals of courtesy and personal honor.

2. He will refrain from associating himself with or allowing the use of his name by an enterprise of questionable character.

3. He will advertise only in a dignified manner, being careful to avoid misleading statements.

4. He will regard as confidential any information obtained by him as to the business affairs and technical methods or processes of a client or employer.

5. He will inform a client or employer of any business connections, interests or affiliations which might influence his judgment or impair the disinterested quality of his services.

6. He will refrain from using any improper or questionable methods of soliciting professional work and will decline to pay or to accept commissions for securing such work.

7. He will accept compensation, financial or otherwise, for a particular service from

one source only, except with the full knowledge and consent of all interested parties.

8. He will not use unfair means to win professional advancement or to injure the chances of another engineer to secure and hold employment.

9. He will coöperate in upbuilding the Engineering Profession by exchanging general information and experience with his fellow engineers and students of engineering and also by contributing to the work of engineering societies, schools of applied science and the technical press.

10. He will interest himself in the public welfare in behalf of which he will be ready to apply his special knowledge, skill and training for the use and benefit of mankind.

These ten general clauses can, in the opinion of the Committee, be interpreted to cover all cases of questionable conduct that may arise in the engineering profession. It will be necessary during the first few years following their adoption, to have many specific interpretations rendered on certain clauses where professional practice is not wholly standardized. The Committee recognized this need and gave much consideration to methods to meet this situation and to permit the adjustment of engineering thought to single viewpoints as developed in the administration of the code. The standing committees on professional conduct in each organization and the Joint Committee of all organizations will serve to make workable rules of these clauses.

In order that this code should not prove a dead letter on each society's records, the Joint Committee made the further recommendations in its report to care for the administration of the common code of ethics as follows:

The Committee further recommends that the following method of interpreting and administering the Code be adopted by each participating Institute or Society after any necessary provisions have been made in the Constitution and By-laws of the organization.

"The President of each Society or Institute shall appoint a *Standing Committee on Professional Conduct* to administer the Code of Ethics. The duties of such a Committee shall be to interpret the Code and to render opinions on any cases of questionable conduct on the part of members that may be submitted to the Committee. These interpretations shall be reported to the Executive Board of the Institute or Society who may approve these interpretations, or take such other action as may seem just and necessary. The reports of the Committee on Professional Conduct when approved by the Executive Board, shall be printed in abstract and in anonymous form in the Institute's or Society's monthly journal for the instruction and guidance of fellow members.

This Committee on Professional Conduct shall be appointed in each Institute or Society by the President holding office at the time of the adoption of this Code and shall consist of five members, one appointed for five years, one for four years, a third for three years, a fourth for two years and a fifth member for one year only. Thereafter, the President then holding office shall appoint one member annually to serve for five years, and shall also fill any vacancies that may occur for the unexpired term of the member who has withdrawn. These appointments shall be made from among the older members of the Institute or Society, so that advantage may be taken of their mature experience and judgment. The Committee after appointment shall elect its own Chairman and Secretary. The Committee shall have power to secure evidence or other information in any particular case, not only from the organization's own members, but if it should seem desirable, from men in other professions. The Committee may also appoint sub-committees to consider certain cases when deemed necessary.

This Committee shall investigate all complaints submitted to it by the Secretary of the Institute or Society bearing upon the professional conduct of any member and after the member involved has been given a fair opportunity to be heard, the Committee shall report its findings to the Executive Board of the Institute or Society. This report may in some cases suggest certain procedure to the Executive Board.

The Executive Board of the Institute or Society shall have power to act on the recommendation of the Committee on Professional Conduct, either (1) to censure by letter the conduct of the member who has acted contrary to the Code, if the breach is of a minor character, or (2) to cause the member's name to be stricken from the roll of the Institute or Society.

Copies of all reports made by a Committee on Professional Conduct to the Executive Board of each Institute or Society shall be furnished to each other Committee on Professional Conduct administering the Code. This will keep each Committee advised of the interpretations of other Committees, and in time an extended interpretation of the Code can be written based on the reports of the various Committees on Professional Conduct.

As interpretations of the various Committees on Professional Conduct administering this Code may vary at times, it is recommended that the Chairmen of these Committees of the various Institutes or Societies be authorized to act as a Joint Committee to review such differing interpretations and to bring them into unity with one another.

As a matter of record, it is interesting to note the representative character of the Joint Committee, which was composed of the following members:

JOINT COMMITTEE ON CODE OF ETHICS

A. S. C. E.—C. C. Elwell
 A. S. C. E.—A. M. Hunt
 A. I. M. & M. E.—J. Parke Channing
 A. I. M. & M. E.—Philip W. Henry
 A. S. M. E.—A. G. Christie, *Chairman*
 A. S. M. E.—H. J. Hinchey
 A. S. M. E.—Chas. T. Main
 A. S. M. E.—J. V. Martenis
 A. S. M. E.—Robert Sibley
 A. I. E. E.—Comfort A. Adams
 A. I. E. E.—G. Faccioli
 A. I. E. E.—George F. Sever
 A. I. E. E.—L. B. Stillwell
 A. I. E. E.—S. S. Wheeler
 A. S. H. V. E.—Frank T. Chapman
 A. S. H. V. E.—S. A. Jellett
 A. S. H. V. E.—Perry West

This is the first joint endeavor of American engineers to provide the very necessary ethical standards of their profession. Since the code is in general terms only, many will wish further interpretations and explanations of the various clauses. Much might be written on this subject and some additional thoughts might be contributed. The code, however, has not been accepted as a professional standard at the time that this is written. Any elaborations would therefore be merely personal opinions of the writer which might later prove embarrassing to committees on professional conduct. It therefore seems best at the present moment to attempt no further discussions of the various clauses.

The mere fact that such a code has been drafted by such a representative committee is in itself a significant accomplishment. A few years ago engineers publicly stated that such a thing could not be done. Even if the report and code are adopted, much still remains to be done. Decisions and interpretations by the various committees will crystallize still further the

common professional standards and will consolidate engineers as a professional body. An excellent suggestion is that every graduate of an American engineering college should be required to affirm the code before he is granted his degree and starts on the practice of his profession.

While engineers generally regard themselves as members of a profession, the public has not heretofore given them a full measure of professional recognition because the average person has no clear idea of the professional obligations of an engineer. This recent attempt to express the ideals of honorable engineering conduct and the engineer's attitude towards the affairs of life will command the interest and respect of the average citizen and will exert a tremendous influence toward securing for engineering the full measure of respect as a profession that is its just due. With such an objective in view it behooves every engineer to give the new code his fullest support so that he may thereby enhance the honor, dignity and respect of his chosen profession.